



11:15-11:30

Synthèse des travaux sur l'hypertension dans Constances

Jacques Blacher

AP-HP Université Paris Cité



Synthèse des travaux sur l'HTA dans Constances

Pr. Jacques Blacher

**Unité HTA, prévention et thérapeutique cardiovasculaires
Centre de diagnostic et de thérapeutique, Hôtel-Dieu ; AP-HP ; Université Paris Cité**

Juin 2024



**Déclaration de liens d'intérêt de
Jacques Blacher :**

- Absence de participation financière dans le capital d'une entreprise liée aux médicaments.
- Absence de lien durable avec une entreprise liée aux médicaments (contrat de travail, rémunération régulière...).
- Interventions ponctuelles en rapport avec des entreprises liées aux médicaments (essais cliniques, travaux scientifiques, comités scientifiques, rapports d'expertise, conférences, colloques, actions de formation, participation à divers symposia, rédaction de brochures...) avec, le cas échéant, facturation d'honoraires ; et ceci avec la majorité des entreprises du médicaments commercialisant des produits cardiovasculaires et autres produits en rapport avec mes domaines de spécialité (AstraZeneca, Bayer, Elkendi, Hikma, Leurquin, Omron, Organon, Sanofi, ViiV, Vivactis, Vivoptim)
- HAS, ANSM, CNAM, MGEN, Santé Publique France



ÉPIDÉMIOLOGIE DE L'HYPERTENSION ARTÉRIELLE EN FRANCE : PRÉVALENCE ÉLEVÉE ET MANQUE DE SENSIBILISATION DE LA POPULATION

// EPIDEMIOLOGY OF HYPERTENSION IN FRANCE: HIGH PREVALENCE AND LACK OF PUBLIC AWARENESS

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TITRE DU PROJET / <i>PROJECT TITLE</i>
Hypertension Associated Risk Factors and Implications
Acronyme / <i>Acronym</i>
HEART
Référence de votre projet / <i>Your application reference (20XX-A-XXX)</i>
2017-A-078

Objectives:

The objectives of this research project are:

1. To determine the prevalence, treatment, control of HTN and related complications in France.
2. To evaluate the determinants of HTN and predictors of poorly controlled BP.
3. To evaluate the association between HTN and known non-communicable diseases risk factors.
4. To study the quantitative extent to which the recommended lifestyle factors were determinants of BP level in order to promote their individual or general implementation.
5. To modelise the relation of combination of lifestyle risk factors to the risk of hypertension; in other words, which part of hypertension variance could be attributable to lifestyle factors?
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ORIGINAL PAPER

WIL

Prevalence and risk factors of hypertension: A nationwide cross-sectional study in Lebanon

Michelle Cherfan PharmD, MSc^{1,2} | Jacques Blacher MD, PhD^{1,3}  |

Roland Asmar MD⁴ | Mirna N. Chahine PhD^{5,6} | Rouba K. Zeidan PharmD, MPH, PhD⁷

Rita Farah PharmD, MPH, PhD⁸ | Pascale Salameh PharmD, MPH, PhD^{7,8}

Constances



Unhealthy behavior and risk of hypertension – The CONSTANCES population based cohort

<i>Characteristic</i>	<i>All participants n, (%)</i>	<i>Participants without HTN n, (%)</i>	<i>Participants with HTN n, (%)</i>	<i>P value</i>
Overall	86 448	59 432 (68.7)	27 016 (31.3)	
Gender				<0.001
<i>Male</i>	40974 (47.4)	24437 (41.1)	16537 (61.2)	
<i>Female</i>	45474 (52.6)	34995 (58.9)	10479 (38.8)	

Cherfan et al. J Hypertension. 2019

Constances



DASH / PHYSICAL ACTIVITY / ALCOHOL / BMI

MEN

<i>Number of unhealthy behaviors</i>	0	1	2	3 or more	P value
Overall, <u>n</u>(%)	2496 (6.1)	15631 (38.2)	17468 (42.6)	5379 (13.1)	-
Hypertension	721 (28.9)	4629 (29.6)	8126 (46.5)	3061 (56.9)	<0.001

WOMEN

<i>Number of unhealthy behaviors</i>	0	1	2	3 or more	P value
Overall, <u>n</u>(%)	8052 (17.7)	21696 (47.7)	13136 (28.9)	2590 (5.7)	-
Hypertension	1510 (18.8)	4281 (19.7)	3835 (29.2)	853 (32.9)	<0.001

Constances



Term	Model 1	P value	Model 2	P value
DASH				
Unhealthy vs healthy	1.20 [1.09-1.42]	<0.0001	1.18 [1.06-1.36]	0.0001
PHYSICAL ACTIVITY				
Unhealthy vs healthy	1.05 [0.99-1.10]	0.05	1.01 [0.96-1.06]	0.66
BMI				
≥25 vs. <25	2.12 [2.01-2.22]	<0.0001	1.98 [1.88-2.09]	<0.0001
ALCOHOL				
Unhealthy vs healthy	1.33 [1.25-1.43]	<0.0001	1.31 [1.22-1.61]	<0.0001
Nb. Unhealthy behaviors				
0	1.00 (ref)	-	1.00 (ref)	-
1	1.14 [1.02-1.27]	0.02	1.11 [0.99-1.24]	0.06
2	1.89 [1.70-2.11]	<0.0001	1.77 [1.59-1.98]	<0.0001
3 or more	2.54 [2.25-2.87]	<0.0001	2.29 [2.03-2.60]	<0.0001

Abbreviations: BMI, body mass index (Kg/m²); DASH, dietary approach to stop hypertension

Model 1: logistic regression model adjusted for age, education level, monthly income and antihypertensive medications

Model 2: logistic regression model adjusted for age, education level, monthly income, diabetes, dyslipidemia, and antihypertensive medications

MEN

Term	Model 1	P value	Model 2	P value
DASH				
Unhealthy vs healthy	1.13 [1.06-1.25]	<0.0001	1.11 [1.04-1.19]	0.001
PHYSICAL ACTIVITY				
Unhealthy vs healthy	1.08 [1.01-1.15]	0.01	1.06 [1.00-1.13]	0.04
BMI				
≥25 vs. <25	1.97 [1.86-2.09]	<0.0001	1.87 [1.76-1.99]	<0.0001
ALCOHOL				
Unhealthy vs healthy	1.13 [1.02-1.25]	0.02	1.12 [1.01-1.24]	0.04
Nb. Unhealthy behaviors				
0	1.00 (ref)	-	1.00 (ref)	-
1	1.24 [1.14-1.35]	<0.0001	1.22 [1.12-1.33]	<0.0001
2	1.80 [1.65-1.97]	<0.0001	1.71 [1.57-1.88]	<0.0001
3 or more	2.31 [2.01-2.64]	<0.0001	2.14 [1.87-2.45]	<0.0001

Abbreviations: BMI, body mass index (Kg/m²); DASH, dietary approach to stop hypertension

Model 1: logistic regression model adjusted for age, education level, monthly income and antihypertensive medications

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WOMEN

Cherfan et al. J Hypertension. 2019

Constances



DASH / PHYSICAL ACTIVITY / ALCOHOL / BMI

MEN

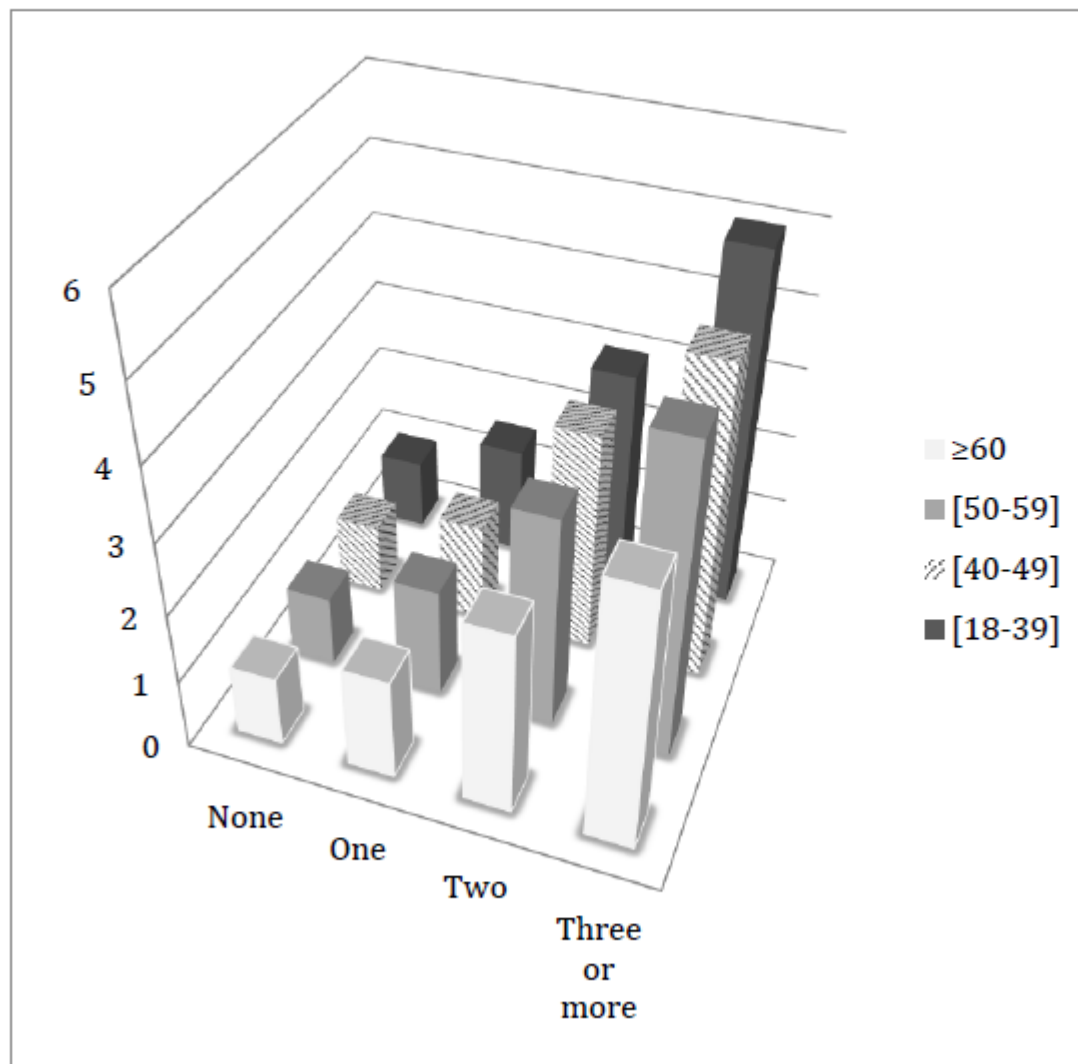
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Cherfan et al. J Hypertension, in press

Figure 2. Odds of hypertension according to unhealthy behavior among age categories



Michelle Cherfan^{a,b,*}, Alexandre Vallée^{c,d,*}, Sofiane Kab^e, Pascale Salameh^{f,g}, Marie Zins^{c,e}, and Jacques Blacher^{a,c,d}

Awareness of Hypertension in France: The CONSTANCES Population-Based Study

Objectives: We aimed to evaluate the individual and combined association between unhealthy behavior and hypertension (HTN).

Methods: We conducted cross-sectional analysis using data from the population-based cohort study CONSTANCES. Blood pressure measurements were taken based on standardized operational procedures. Dietary adherence was done following the dietary approach to stop HTN diet. We considered heavy alcohol drinking, sedentary-level physical activity, low/medium dietary adherence and overweight/obesity as unhealthy behaviors. Participants' characteristics were compared according to the number of unhealthy behaviors and the association between HTN and unhealthy behaviors was estimated using logistic regression.

Results: A total of 86448 volunteer participants were included and the prevalence of HTN was of 31.1%. Of those with HTN, 8.2, 33.0, 44.3 and 14.5% exhibited 2 or at least 3 unhealthy behaviors, respectively. In sexes, the prevalence of HTN increased with low dietary adherence compared with high ($P < 0.01$). Overweight/obese compared with normal BMI ($P < 0.05$) and with sedentary physical activity compared with high in women only ($P = 0.02$). Combination of several unhealthy behaviors was associated with increased odds of HTN (P trend < 0.001). Reporting 2 or at least 3 unhealthy behaviors had an adjusted odds ratio of HTN of 1.77 in men and 1.24, respectively.

Conclusion: Individual and combined unhealthy behaviors were strongly associated with hypertension in the CONSTANCES population-based study.

Keywords: alcohol consumption, BMI, dietary approach to stop hypertension diet, epidemiology, hypertension, lifestyle behavior, physical activity

Abbreviations: ABPM, ambulatory blood pressure monitoring; BP, blood pressure; CI, confidence interval; CNAMTS, Caisse nationale d'assurance maladie des travailleurs salariés; CONSTANCES, cohorte des CONSULtANTS des Centre d'examen de sante de la Securite sociale; CVD, cardiovascular disease; DASH,

dietary screen ratio

IN

OBJECTIVES
We aimed to assess the hypertension (HTN) awareness and associated factors in France.

METHODS
We conducted a cross-sectional analysis using data from the CONSTANCES population-based cohort involving 87,808 volunteer participants included between 2012 and 2018. HTN was defined as average blood pressure (BP) over 140/90 or use of BP medication, awareness as self-reported HTN. Multivariable logistic regression models were used to identify the associated factors.

RESULTS
Overall, 27,160 hypertensive participants (men = 16,569) above 18 years old were analyzed. Hypertension awareness rate was 37.5%. In the multivariable regression model, awareness was predicted by female gender, age, prior cardiovascular disease (CVD), presence of diabetes mellitus (DM), presence of chronic kidney disease (CKD), level of education, and obesity or overweight. Older participants ($P < 0.001$), females ($P < 0.001$), participants with comorbidities ($P < 0.001$), were more likely to be aware when compared with younger participants, males and participants without comorbidities, respectively. The unawareness among participants without cardiometabolic factors (CMF), CVD, DM, CKD) was higher than participants with CMF (67.6% vs. 41%, respectively, $P < 0.001$). Moreover, some differences appeared in both genders in the association between awareness of HTN and health and lifestyle factors.

CONCLUSION
Our findings show that HTN awareness is low. Particular attention should be given to young men without comorbidities as these characteristics were predictors of poor awareness. Immediate action is required to improve HTN awareness in France.

Keywords: awareness; blood pressure; epidemiology; France; hypertension; risk factors.

doi:10.1093/ajh/hpaa018

Cardiovascular diseases (CVD) are still identified by the WHO as the primary cause of total mortality worldwide and hypertension (HTN) is recognized as the leading risk factor cause for CVD.¹ Hypertension affects more than 1 billion people and is projected to reach 1.56 billion by 2025.² However, less than 50% of the affected population in many countries are aware of their high blood pressure (BP) status.³ Such awareness is crucial to control and treat HTN and is also key to individuals making changes to their lifestyle and dietary habits. That vary considerably between countries and population groups within countries.³ In order to further improve BP control, it is critical to understand the characteristics of those who are not aware of their HTN so that new strategies can be targeted and tailored to the needs of high-risk subgroups in each country.

To our knowledge, few studies evaluated the rate and the factors associated with HTN awareness in France from a large population-based perspective. The French nationwide CONSTANCES cohort⁴ represents a major opportunity to provide further epidemiologic data on this subject. Therefore, we conducted this study to estimate rate of awareness of HTN according to gender, and investigate the association of sociodemographic, health, and lifestyle factors with the awareness of HTN.

METHODS
Study design and study population
This ancillary study is a cross-sectional analysis using data from the CONSTANCES cohort. Details about the study

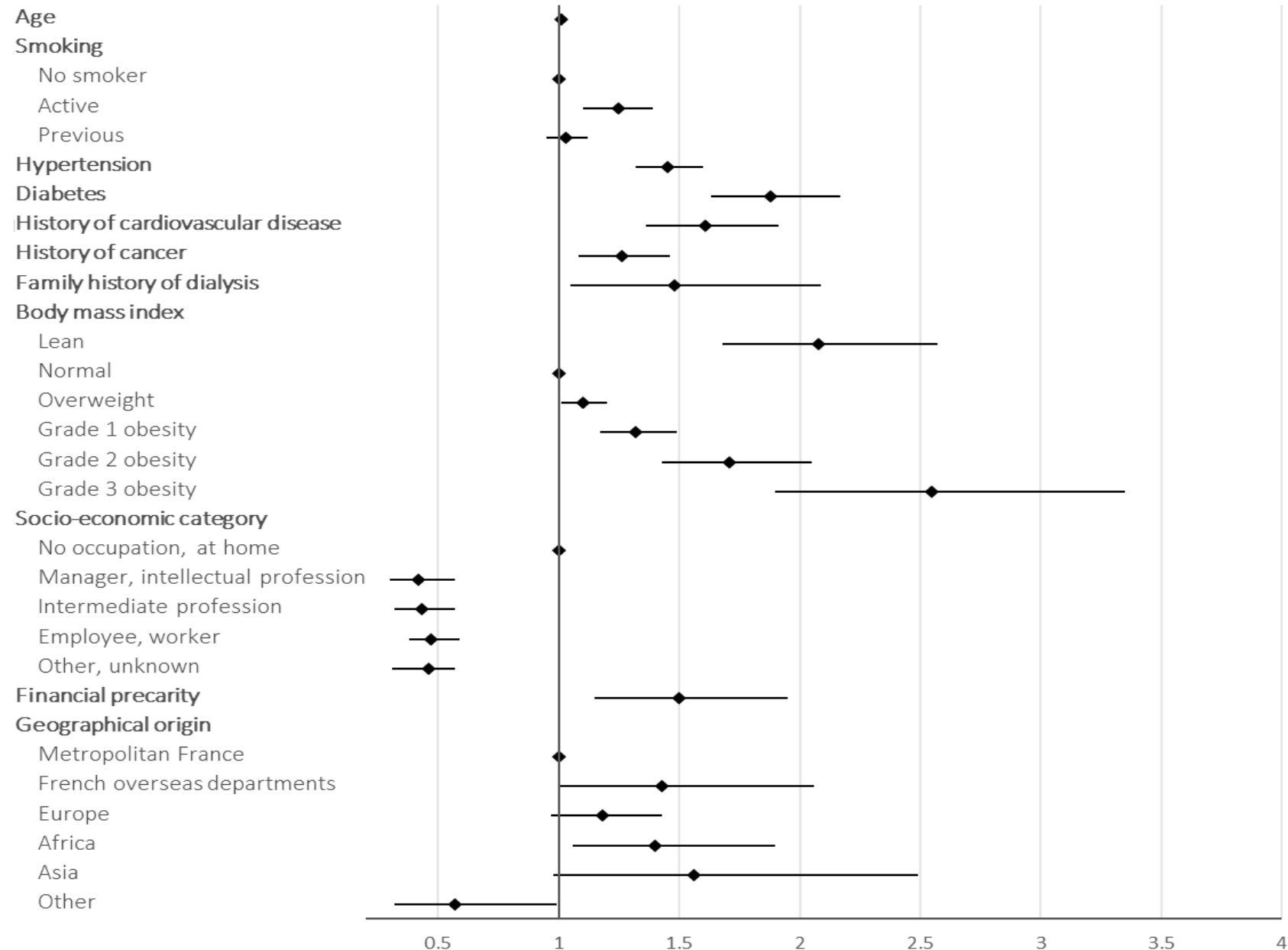
^aINSERM U1153, Paris, France; ^bINSERM U1153, Paris, France; ^cINSERM U1153, Paris, France; ^dINSERM U1153, Paris, France; ^eINSERM U1153, Paris, France; ^fINSERM U1153, Paris, France; ^gINSERM U1153, Paris, France.
*Michelle Cherfan and Alexandre Vallée contributed equally to this work.
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Factors and risk of hypertension in individuals-The CONSTANCES population-based

, Sofiane Kab⁵, Pascale Salameh^{6,7}, Jacques Blacher^{1,2,3,4,}

Identifying the individual and the combined effect of lifestyle factors and the combined effect of lifestyle factors (BP) deserves further evaluation. We aimed to examine the association between unhealthy behaviors and uncontrolled hypertension in the CONSTANCES population-based cohort study. Uncontrolled BP was defined as systolic BP ≥ 160 mmHg and/or mean diastolic BP ≥ 90 mmHg. Unhealthy behaviors were defined as heavy alcohol drinking, low or medium adherence to dietary recommendations, sedentary-level physical activity, and overweight. A total of 10,710 hypertensive treated volunteer participants were included in the analysis. Of them, 2.0%, 24.5%, 54.0% and 19.5% had uncontrolled hypertension; of them, 2.0%, 24.5%, 54.0% and 19.5% had uncontrolled hypertension respectively. In men, there was an increased odds of uncontrolled hypertension with heavy alcohol drinking compared to light-or-never (adjusted odds ratio 1.33, 95% CI 1.09–1.63), with low as well as with medium adherence to dietary recommendations (adjusted odds ratio 1.33 for both), and with overweight or obesity compared to a normal body mass index (adjusted odds ratio 1.33 for both). In addition, men reporting a combination of ≥ 3 unhealthy behaviors had an increased odds of hypertension of 1.67 (95% CI 1.09–2.53). Unhealthy behaviors were associated with uncontrolled hypertension, at the individual and combined level, and improvement of modifiable lifestyle factors could offer considerable benefits in the management of hypertension.

Figure 2: Factors associated with the presence of CKD in multivariate analysis (Forrest-plots)



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C'est une hypertension nerveuse

Je ne me sens pas malade

**C'est à cause de mon
patron/collègue/femme/mari/maîtresse/
amant/enfant/parent/bouc émissaire**

Je suis très sensible aux médicaments

Conclusion

- **Epidémiologie d'observation complémentaire à l'épidémiologie d'intervention**
- **Observance : problématique majeure**
- **Défiance grandissante vis-à-vis des:**
 - **Experts**
 - **Médicaments, vaccins**
 - **Médecins**
 - **Stratégies de prévention**
 - **Laboratoires**
 - **...**
- **Constances pourrait donner des pistes opérationnelles ?**